

chain triglycerides can also be used. See, e.g., U.S. Pat. No. 4,863,753 to Hunter et al. Other oils which may be used include a triacylglycerol oil such as liquid Salatrim™ oil (sold under the trade name Benefat™ III by Cultor Food Science, New York, N.Y.).

[0024] The term “non-digestible fat” refers to those edible fatty materials that are partially or totally indigestible, e.g., polyol fatty acid polyesters, such as OLEAN™.

[0025] While this invention will be generally described in terms of Olestra, it should be readily apparent that other fat substitutes or mixtures thereof could also be utilized in, and are contemplated by, this invention. Mixtures of fats and fat substitutes are also contemplated herein.

[0026] By “polyol” is meant a polyhydric alcohol containing at least 4, preferably from 4 to 11 hydroxyl groups. Polyols include sugars (i.e., monosaccharides, disaccharides, and trisaccharides), sugar alcohols, other sugar derivatives (i.e., alkyl glucosides), polyglycerols such as diglycerol and triglycerol, pentaerythritol, sugar ethers such as sorbitan and polyvinyl alcohols. Specific examples of suitable sugars, sugar alcohols and sugar derivatives include xylose, arabinose, ribose, xylitol, erythritol, glucose, methyl glucoside, mannose, galactose, fructose, sorbitol, maltose, lactose, sucrose, raffinose, and maltotriose.

[0027] By “polyol fatty acid polyester” is meant a polyol having at least 4 fatty acid ester groups. Polyol fatty acid esters that contain 3 or less fatty acid ester groups are generally digested in, and the products of digestion are absorbed from, the intestinal tract much in the manner of ordinary triglyceride fats or oils, whereas those polyol fatty acid esters containing 4 or more fatty acid ester groups are substantially non-digestible and consequently non-absorbable by the human body. It is not necessary that all of the hydroxyl groups of the polyol be esterified, but it is preferable that disaccharide molecules contain no more than 3 unesterified hydroxyl groups for the purpose of being non-digestible. Typically, substantially all, e.g., at least about 85%, of the hydroxyl groups of the polyol are esterified. In the case of sucrose polyesters, typically from about 7 to 8 of the hydroxyl groups of the polyol are esterified.

[0028] The polyol fatty acid esters typically contain fatty acid radicals typically having at least 4 carbon atoms and up to 26 carbon atoms. These fatty acid radicals can be derived from naturally occurring or synthetic fatty acids. The fatty acid radicals can be saturated or unsaturated, including positional or geometric isomers, e.g., cis- or trans- isomers, and can be the same for all ester groups, or can be mixtures of different fatty acids.

[0029] Liquid non-digestible oils are also included in the term “lipid.” Liquid non-digestible oils have a complete melting point below about 37° C. include liquid polyol fatty acid polyesters (see Jandacek; U.S. Pat. No. 4,005,195; issued Jan. 25, 1977); liquid esters of tricarballic acids (see Hamm; U.S. Pat. No. 4,508,746; issued Apr. 2, 1985); liquid diesters of dicarboxylic acids such as derivatives of malonic and succinic acid (see Fulcher; U.S. Pat. No. 4,582,927; issued Apr. 15, 1986); liquid triglycerides of alpha-branched chain carboxylic acids (see Whyte; U.S. Pat. No. 3,579,548; issued May 18, 1971); liquid ethers and ether esters containing the neopentyl moiety (see Minich; U.S. Pat. No. 2,962,419; issued Nov. 29, 1960); liquid fatty polyethers of

polyglycerol (See Hunter et al; U.S. Pat. No. 3,932,532; issued Jan. 13, 1976); liquid alkyl glycoside fatty acid polyesters (see Meyer et al; U.S. Pat. No. 4,840,815; issued Jun. 20, 1989); liquid polyesters of two ether linked hydroxypolycarboxylic acids (e.g., citric or isocitric acid) (see Huhn et al; U.S. Pat. No. 4,888,195; issued Dec. 19, 1988); various liquid esterified alkoxyated polyols including liquid esters of epoxide-extended polyols such as liquid esterified propoxyated glycerins (see White et al; U.S. Pat. No. 4,861,613; issued Aug. 29, 1989; Cooper et al; U.S. Pat. No. 5,399,729; issued Mar. 21, 1995; Mazurek; U.S. Pat. No. 5,589,217; issued Dec. 31, 1996; and Mazurek; U.S. Pat. No. 5,597,605; issued Jan. 28, 1997); liquid esterified ethoxyated sugar and sugar alcohol esters (see Ennis et al; U.S. Pat. No. 5,077,073); liquid esterified ethoxyated alkyl glycosides (see Ennis et al; U.S. Pat. No. 5,059,443, issued Oct. 22, 1991); liquid esterified alkoxyated polysaccharides (see Cooper; U.S. Pat. No. 5,273,772; issued Dec. 28, 1993); liquid linked esterified alkoxyated polyols (see Ferenz; U.S. Pat. No. 5,427,815; issued Jun. 27, 1995 and Ferenz et al; U.S. Pat. No. 5,374,446; issued Dec. 20, 1994); liquid esterified polyoxyalkylene block copolymers (see Cooper; U.S. Pat. No. 5,308,634; issued May 3, 1994); liquid esterified polyethers containing ring-opened oxolane units (see Cooper; U.S. Pat. No. 5,389,392; issued Feb. 14, 1995); liquid alkoxyated polyglycerol polyesters (see Harris; U.S. Pat. No. 5,399,371; issued Mar. 21, 1995); liquid partially esterified polysaccharides (see White; U.S. Pat. No. 4,959,466; issued Sep. 25, 1990); as well as liquid polydimethyl siloxanes (e.g., Fluid Silicones available from Dow Corning). All of the foregoing patents relating to the liquid nondigestible oil component are incorporated herein by reference. Solid non-digestible fats or other solid materials can be added to the liquid non-digestible oils to prevent passive oil loss. Particularly preferred non-digestible fat compositions include those described in U.S. Pat. No. 5,490,995 issued to Corrigan, 1996, U.S. Pat. No. 5,480,667 issued to Corrigan et al, 1996, U.S. Pat. No. 5,451,416 issued to Johnston et al, 1995 and U.S. Pat. No. 5,422,131 issued to Elsen et al, 1995. U.S. Pat. No. 5,419,925 issued to Seiden et al, 1995 describes mixtures of reduced calorie triglycerides and polyol polyesters that can be used herein but provides more digestible fat than is typically preferred.

[0030] The preferred non-digestible fats are fatty materials having properties similar to triglycerides such as sucrose polyesters. OLEAN™, a preferred non-digestible fat, is made by The Procter and Gamble Company. These preferred non-digestible fat are described in Young; et al., U.S. Pat. No. 5,085,884, issued Feb. 4, 1992, and U.S. Pat. No. 5,422,131, issued Jun. 6, 1995 to Elsen et al.

[0031] All percentages are by weight unless otherwise specified.

B. LIPID-BASED FILLING

[0032] As used herein, “lipid-based filling” includes any filling comprising at least about 20% lipid. Preferably, the principal lipid component is a non-digestible fat. The fillings of this invention typically have a lipid component making up from about 20% to about 60% of the total filling composition. The preferred fillings are of a low moisture content to promote shelf stability. The lipid-based fillings have a water activity (Aw) of less than about 0.6.

[0033] The inclusion of a sucrose polyester non-digestible fat allows for a reduced fat, reduced calorie product that has